American College of Surgeons
Committee on Trauma

CONSULTATION FOR TRAUMA SYSTEMS

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Preamble

Historically, trauma *centers* were inner-city county hospitals that had de facto trauma center status; however, in the 1970s, an evolution occurred with the development of trauma *systems*. Although the designated hospital is a key component in the *acute* care of the severely injured, the trauma system encompasses all phases of care, from prehospital through acute care and rehabilitation. The initial trauma systems in this country were "exclusive" in nature. They focused on the "major trauma patient" and the "designated trauma center." The next step was to address the needs of *all injured* patients in a given geographical area. The concept of an *inclusive* trauma system was described in the CDC Position Paper on Trauma Care Systems. This paper put forth the concept that a trauma system should provide optimal care, given available resources, for all trauma patients no matter where they are injured or treated.

In 1988, the National Highway Traffic Safety Administration began a technical assistance program to states and communities called the "Development of Trauma Systems (DOTS)." This program provided the conceptual framework for development of trauma systems. To date, 51 states and communities have participated in the DOTS program. The Trauma Care Systems Planning and Development Act (PL 101-590) of November 1990 has provided great impetus to the development of trauma *systems* in the US. This Act called for a Model Trauma Care System Plan, which was written in 1992 under the auspices of the Health Resources Services Administration (HRSA). This model clearly outlines the basic components and has been the template for many new trauma systems in the US; however, it did not provide for the *evaluation* of the trauma system. Meanwhile the American College of Surgeons' Committee on Trauma (ACS COT) has had extensive experience in evaluating individual trauma centers through its Verification Program. In recent years it has become apparent that a similar evaluation process is needed for trauma systems.

The ACS COT formed a multidisciplinary "Working Group for Trauma System Evaluation." The charge was to develop an instrument to facilitate an objective evaluation of any trauma system regardless of the stage of system maturity or the geographic location. This document, "Consultations for Trauma Systems" is based on several key principles. The process must:

- be "consultative" in nature and designed to help trauma systems develop and improve
- be designed to evaluate a trauma system at whatever stage of development, geographic location, or population density
- be designed to evaluate the care of patients of all ages.
- be carried out by a multidisciplinary team
- have a process for ongoing support and re-evaluation

The initial guidelines have been developed with input from many disciplines and with the plan to solicit constructive comments from any other groups with a vested interest in the development of trauma systems in the US.

The ultimate goal is to provide an evaluation process that will contribute to the initial development, evolution, and improvement of trauma systems in this country and around the world.

The importance and immediate need for a process to evaluate trauma systems has led to the production of

simultaneous documents, one by the American College of Surgeons multidisciplinary working group and another by the Health Resources and Services Administration (HRSA). We believe the two documents are complementary and together will provide a sophisticated evaluation process. Our mutual goal is to aid in the establishment and evolution of trauma systems. The use of and constructive feedback on both documents will make future revisions even more useful.

This document has been developed as a tool for those persons who are charged with evaluating trauma systems. Each section is built around a specific trauma system component and follows the same format:

- **Statement of Purpose**

- **Pre-Review Questionnaire**
  These questions will be compiled in a questionnaire that would be sent to the trauma system prior to an actual site visit. Such a completed questionnaire would be submitted and reviewed by the site visit team in preparation for the site visit.

- **Documentation**
  Documents supporting the answers contained in the questionnaire would be requested in advance and should be available at the time of the site visit.

- **Questions for the Reviewer(s)**
  These questions will be used by the site visitors to ensure standardization of the evaluation process.

This process is designed for the explicit purpose of facilitating a consistent, efficient, and in-depth evaluation of any trauma system.

Mission Statement

Mission: To promote the development and enhancement of trauma systems throughout the United States.

Goal: To assess trauma systems and provide guidance for further system development and enhancements.

A. Administrative Components

1) Leadership

Purpose

There should be a trauma system lead agency with an identified key person. The lead agency will usually be a government agency with the authority, responsibility, and resources to lead the development, operations, and evaluation of the trauma system. The statutes, regulations, policies, or guidelines should direct that the lead agency will:

a. ensure the integration of the EMS system, including all prehospital components.

b. coordinate system design.

c. establish minimum standards for system performance and patient care.

d. create a Trauma System Advisory Committee that is composed of prehospital personnel, hospital personnel, rehabilitation personnel, payors, consumers, and public interest groups. This committee should serve to guide system planning activities, define system criteria (number of centers, volume), recommend system standards (triage, timelines), and review system performance.

e. have sufficient staffing, including a trauma system coordinator experienced in trauma system development and implementation.

f. identify the key person in the lead agency.

The trauma system should have a strong role for a trauma physician(s) as an integral part of its leadership component. This physician, Trauma Medical Director, should be qualified to participate in the planning of the trauma system, work with the lead agency, be incorporated into the system, and be responsible for design and implementation of the trauma system, medical accountability, and ensuring an appropriate medical response to the trauma patient.

Pre-Review Questionnaire

Please provide an explanation for each affirmative response. For each negative response, provide an explanation for the system's plan to comply.

1. What is the organizational structure of the lead agency, including reporting requirements?

2. Is there a Trauma System Advisory Committee?
   Who is on the committee (what groups are represented)?
   What are the goals and objectives of the committee?
   If the committee has met, what has it accomplished to date? What is the authority, responsibility,

and reporting requirement of the committee?

3. Does the lead agency have a Trauma Medical Director?
   Are there plans to have a Trauma Medical Director in the future?

4. What are the role and responsibility of the Trauma Medical Director?
   What are the qualifications of the Trauma Medical Director?
   What is the authority for the Trauma Medical Director?

5. Is there a trauma system administrator with expertise in trauma system development/ implementation?
   Are other trauma system support resources (equipment and personnel) available for trauma system implementation and planning?

Documentation (Provide on site)

- Organizational charts, with a short narrative description of duties and authority, and show the relationship with the other EMS components; include the Medical Director in the organizational description and chart.

- A list of organizations that participate on the Trauma System Advisory Committee; include goals, objectives, and policies that guide the committee.

- A copy of the relevant statutes and regulations pertaining to lead agency structure and organization, including Medical Director and Advisory Committee participation.

- A copy of CV for the key lead agency person.

Reviewer

1. Has the governing body designated a lead agency?
   How is the lead agency given the authority to run the system?
   Is the authority sufficient for the lead agency to carry out its duties?

2. Does the trauma system have strong trauma medical leadership as demonstrated by attendance at trauma advisory meetings and development of policies and procedures?
   Are trauma physicians incorporated into the planning and development process?
   Does the Trauma Medical Director have the authority and responsibility to carry out those functions?

3. Are the rules and regulations for trauma system planning and operations understood by the trauma system participants?
   How does the lead agency ensure system-wide participation and disseminate information?

2) System Development

Purpose

The trauma system lead agency should have a defined planning process for trauma system development that addresses:

- identifying trauma care resources, including resource deficits within the defined area of the trauma system
- developing and implementing trauma care plans and systematically reviewing plans over time
- including health professionals, consumer groups, and payors in trauma system planning
- approving the trauma system plan
- establishing, reviewing, and revising trauma system standards of care, including policies, procedures, and protocols for both the prehospital and hospital personnel
- analyzing the financial impact of developing and implementing the trauma system

The trauma system should be integrated with the EMS system and should include a mechanism to interface with and incorporate other EMS plans, such as disaster and mass casualty. It should also have a mechanism to integrate managed care entities in the area.

Pre-Review Questionnaire

Please provide an explanation for each affirmative response. For each negative response, provide an explanation for the system's plan to comply.

1. Has the trauma system completed a needs assessment and identified appropriate trauma system resources?

2. Does a process exist for setting realistic time frames for implementing each component of the system?

3. Is there a process to build a constituency group and involve prehospital/hospital and other health professionals and consumer groups in planning, developing, and supporting the trauma system?

4. Have appropriate trauma care guidelines and system standards of care been developed or adopted, including trauma policies, procedures, and protocols?

5. Is the trauma system integrated with the EMS system?
   With mass casualty and disaster response systems?
   With managed care programs?

6. Does the trauma system have a mechanism to integrate managed care entities in the area?

7. How have the incentives changed within the trauma system? Specifically, do you have a mechanism to assess the changes and incentives (risks and benefits) in caring for trauma patients? How has managed care affected reimbursement for trauma care?

8. Does the system have a plan to deal with patients of all ages?

Documentation (Provide on site)

- Completed needs assessment
- Lists of constituency groups involved in planning and development
- Copies of trauma system plan, including guidelines, standards, policies, procedures, and protocols

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Reviewer

1. Has the system completed a needs assessment?
   Does it include the identification of resources necessary to care for the major trauma patient?

2. Do consumer and professional constituency groups believe that they are an integral part of the planning and development process?

3. Have appropriate guidelines for system development been established?

4. Does the system development process include integration of disaster and mass casualty EMS plans?

3) Legislation

Purpose

Comprehensive legislation is essential for trauma system development. The creation of statutes and regulations to develop the trauma system sets in place the necessary legal authority to move forward without concerns about anti-trust issues. Comprehensive statutes and regulations can provide for the process of planning, implementing, and funding the trauma system. Key provisions in trauma legislation include the ability to work through constituency groups to:

a. develop a comprehensive trauma system plan

b. integrate the trauma program with the existing EMS system

c. incorporate prevention programs and activities

d. establish or adopt guidelines for the prehospital, acute hospital, and the rehabilitation phases of trauma care

e. collect data and evaluate system performance

f. provide for confidentiality of trauma records, reports, and quality of care reviews

g. establish authority to designate trauma centers

h. provide authority for the inter/intrastate and international planning and implementation of trauma systems, without regard to jurisdictional boundaries

Additionally, trauma legislation should include a dedicated funding mechanism and an administrative structure for trauma management and should ensure fiscal support for all components of the system, including the legal authority to ensure that third-party payment is coordinated within the trauma system.

Pre-Review Questionnaire

Please provide an explanation for each affirmative response. For each negative response, provide an explanation for the system's plan to comply.

1. Are there comprehensive trauma care legislation and regulations pertaining to the development of the trauma system?

2. Does the legislation establish a lead agency with the authority to plan, develop, implement, and evaluate the inclusive trauma care system?
   What is the lead agency?
3. Does the legislation include provisions for:

a. a trauma system plan
b. integration of trauma and EMS systems
c. prevention programs
d. establishment or adoption of standards of care
e. the designation of trauma centers
f. organization of data collection and system evaluation
g. confidentiality protection of data collection or quality improvement records/reports
h. quality management and quality improvement programs
i. anti-trust protection

4. Does the legislation authorize dedicated and earmarked trauma funding? Are the funds placed in a special account rather than in a general fund?

Documentation (Provide on site)

- A copy of the trauma statutes and regulations
- A copy of the regulations that govern the development of trauma systems
- Any other laws, ordinances, or executive orders that affect the development and implementation of trauma systems

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Reviewer

1. Does the legislation provide the lead agency with the authority necessary to structure a trauma system and the mechanism to plan and implement it?

2. What barriers or opportunities has the legislation caused that either inhibit or enhance trauma system development?

3. Does the legislation provide for secure funding of trauma system development and necessary financial support of trauma system components?

4) Finances

Purpose

Evaluating the health of a trauma system's finances is still in its early development stages. This section outlines generally accepted business financial principles that are used as baseline.

At all levels of evolution, the trauma system should demonstrate through its trauma system lead agency financial accountability. This accountability should first include lead agency reporting of financial stability. Second, the lead agency should show the *development* of routine financial reporting by component, which reflects the financial health of the system. Trauma system components include system management, prehospital, trauma facilities, acute care, rehabilitation, and prevention programs. The lead agency should have established the following processes:

Lead Agency Financial Accountability

- A standardized model accounting report that lists costs and is used consistently with standardized definitions throughout the system.
- A process to develop, review, approve, and monitor expenditures and revenues by line item.
- A process to develop, review, approve, and monitor each component's costs over time.
- A process that allows the trauma system financial costs to reflect its relationship to the trauma plan outcome measures.
- A process for maintaining at least two years of audited financial records that meet accepted financial accounting principles.
- A process to audit the financial health of the trauma system over time.

Component Financial Accountability

- A process that defines how trauma centers integrate alternative delivery systems (payor systems) into the trauma program.
- A process that defines how rehabilitation centers integrate alternative delivery systems (payor systems) into the trauma program.
- A process that defines the incremental component costs associated with trauma system participation.

Overall, the lead agency financial component should be integrated with other existing plans of the emergency medical service system to include, but not be limited to, disaster, prehospital, trauma facilities, acute care, rehabilitation, and prevention programs.

Pre-Review Questionnaire

Please provide an explanation for each affirmative response. For each negative response, provide an explanation for the system's plan to comply.

1. a. Are there two years of audited trauma system financial reports, as defined by generally accepted accounting principles?
   Explain the budget review process.

   b. Are costs reported in a standardized model accounting format?

2. Does the lead agency report its finances by component, in summary, or both?
   How are the finances documented for review? Give an example.

3. What are the sources and terms of external funding (for example, grants, state/local taxes)?
   If a funding source is tied to a specific program (for example, drunken driving, registration tax), provide past history and future projections.

4. Does the budget coordinate with the goals and objectives of the trauma plan?

5. Does the trauma center track and measure trauma costs by patient, diagnosis, length-of-stay at (ICU) facility, department, physician, and payor?
   If yes, how is this information used (for example, feedback to physicians)?
   Is this information forwarded to the lead agency?

6. Does the trauma system equate costs to relative value gained (cost of utilizing resources)?

7. Does the trauma system or center track payor mix utilization?
   If yes, what is the current payor mix, relative collection ratios, and defined trends?

Documentation (Provide on site)

- C The past two years of audited lead agency financial statements, including balance sheets, income statements, and operating and capital budgets
- C Reconciliation of audited financial statements to standardized model cost reports for trauma system management
- C A lead agency financial organizational reporting chart
- C A copy of the lead agency's budgets and indicate those line items directly related to specific objectives of the trauma plan
- C Letters and/or legislation that document financial or in-kind commitment
- C Documentation that demonstrates completed assessments and compares cost to relative value added
- C Documentation that demonstrates the integration of alternative delivery care systems with the trauma system
- C The past three years of payor mix and collection ratios

Reviewer

1. Does the trauma system have a commitment to a standard accounting financial structure?
2. How is short-term financial stability defined?
3. How is long-term financial stability defined?

B. Operational and Clinical Components

1) Injury Prevention and Control

Purpose

- A comprehensive injury control system includes prevention and rehabilitation in addition to acute care. The ultimate goal of an organized trauma care system is to prevent injuries, just as the ultimate goal of medicine is to prevent disease. Consequently, the trauma care system should participate in the establishment of a system-wide injury control coalition (SICC). One form is an IPC or injury prevention center. Composed of members from public and private sectors interested in prevention activities, this coalition will create prevention partnerships to reduce fragmentation and intensify community interventions.

- Jointly with the SICC,a plan to promote injury control should be developed and implemented that will:

    a) heighten awareness of injury as a public health problem;

    b) educate elected officials and the public about the need for trauma care systems and injury control to promote the passage and implementation of legislation aimed at reducing injury;

    c) educate the public about current trauma system development;

    d) educate the public about how to safely approach an injury scene, access the trauma care system, and provide assistance to the injured person until professional help arrives;

    e) involve public/voluntary organizations to aid system financing;

    f) conduct injury surveillance;

    g) develop a system-wide consensus approach to injury control interventions using needs assessment and intervention evaluation;

    h) communicate key trauma prevention strategies.

- The trauma care system should do a needs assessment to identify priority injury problems (including identification of high-risk groups and environmental factors).

- With the support of the trauma care system, the SICC should develop and implement priority injury control interventions that follow the injury control plan.

- The SICC should carry out a public information program that follows the injury control plan.

- The SICC should evaluate the success of injury control interventions. Outcome evaluations using trauma system data are preferable.

- The SICC should integrate the potential of an organized entity to promote prevention activities within the system.

Pre-Review Questionnaire

Please provide an explanation for each affirmative response. For each negative response, provide an explanation for the system's plan to comply.

1. Does your system have a system-wide injury control coalition? If yes, what are the member organizations?

2. What plans has the coalition developed?

3. Which elected officials have been educated about injury and injury control?

4. How are you involved with public/voluntary organizations to aid system financing?

5. What local injury surveillance data has the coalition reviewed (mortality data from vital records, police traffic crash data, EMS-run data, E-coded hospital discharge data)? What injury problems and high-risk groups and environments were identified?

6. Have open community forums been held to identify injury control issues of concern to the community? What key problems were identified?

7. What priority injury problems has the coalition identified?

8. What intervention plan has been developed to address the priority injury control issues?

9. How will you evaluate the effectiveness of the priority injury control initiatives? What are the results of any completed evaluations?

Documentation (Provide on site)

1. A list of coalition members and meeting dates

2. A copy of the injury control plan developed by the coalition

3. Brochures and curriculum for educational programs on injury control

4. A list of public/voluntary organizations with which you are involved to aid financing of the system

5. Descriptive injury surveillance data for problem injuries, high-risk groups, and environmental factors that affect your system

6. A description of injury control interventions undertaken

7. Reports/publications evaluating local injury control interventions

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Reviewer

1. Is there a system-wide injury control coalition?

2. Is there an injury control plan? If yes, provide executive summary.
   Does it define its scope?

3. How substantial are the efforts of public/voluntary organizations to aid financing of the system?

4. Is there evidence that injury interventions have been reasonably well planned and implemented? Has expertise outside the trauma system been utilized?

5. Is injury surveillance ongoing (including population-based data collection and review of the data by the SICC)?

2) Human Resources

a) Workforce Resources

Purpose

The trauma system should have a distinct process for evaluating the adequacy of human resources available (within and outside the hospitals) to support normal system activity. The process should:

- match resources with patient needs
- define the optimal number and type of prehospital personnel and resources to be available to care for trauma patients
- define the optimal number and type of hospital personnel and resources to be available to care for patients in all areas of the hospital
- address periodic reevaluation of resources through an initial needs assessment and identification of trauma care work force resources and matching resources to patient care
- determine a plan for dynamic flexible response for optimal management of patients during peak periods of activity that stress the system (both prehospital and hospital resources should be included in the plan)
- address recruitment and retention of qualified personnel
- identify current numbers of certified prehospital personnel and their level of certification
- identify current hospital personnel resources, including physicians and their specialties, nurses, and other health care personnel
- evaluate resources and personnel in trauma specialty care units for pediatric, burn, spinal cord, head injury, and rehabilitation centers
- identify the number and severity of injured patients cared for by hospitals and individual surgeons
- assess the impact of system operations on existing levels of professional resources within the community, including limited physician specialists, such as neurosurgeons, orthopaedic surgeons, anesthesiologists, and so on
- identify the number and severity of injured patients cared for by emergency physicians.

Pre-Review Questionnaire

Please provide an explanation for each affirmative response. For each negative response, provide an explanation for the system's plan to comply.

1. Describe your system for evaluating and assessing the adequacy of the work force resources available within and outside of the hospital. Describe the current strengths and weaknesses of your system of evaluating the level and adequacy of human resources for the entire trauma care delivery system.

2. Describe how you have standardized the number and type of human resources to be available for the prehospital management of EMS patients, including the trauma patient.

3. Do you have a quality management plan for monitoring availability of prehospital and hospital trauma care resources?

4. Have you developed a process for evaluating resource usage and matching resource response relative to levels of activity and level of patient care needs and system response? Discuss the sources of information and data for monitoring the system.

    a. Have you identified the need for an increased or decreased number of personnel in the prehospital arena? Discuss strategies for securing needed personnel.

    b. Have you identified the need for an increased or decreased number of personnel in the systems administration or hospital arena? Discuss strategies for securing needed personnel.

5. Outline your plan for flexible response to manage all patients during peak periods of activity that might stress the system. What is your protocol for trauma center divert and prehospital transport responses? How do you evaluate its effectiveness, and what are your options for creating a change?

Documentation (Provide on site)

C A copy of the standards or proposed standards that specify availability of human resources within the trauma system

C A copy of all needs assessments that identify and evaluate the need for human resources in the prehospital and hospital arenas

C A current list of resource deficiencies identified by your evaluation.

C A geographic description of prehospital care units and the number and type of personnel covering these areas

C A geographic description of all hospitals, trauma centers, and specialty hospitals, including information on the number of trauma transports for each prehospital agency and the number of admissions for each hospital

C A copy of the report of number on the current hospital personnel resources (by hospital/trauma

center), including specialty services that participate or are available to participate in the trauma centers

- The portion(s) of your quality management plan that monitors human resources availability
- A log of divert status and bypass protocols (standards)

Reviewer

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1. Has the system done a complete needs assessment and identified available and needed the human resources?

2. Have standards been developed for the minimum resources to be available to operate the system?

3. Is an effective monitoring plan in place for identifying problems associated with the lack of human resources? Does the agency have access to appropriate data that facilitate the problem identification and quality improvement activity? Does the monitoring plan identify strengths and weaknesses? Have appropriate action plans been developed? Are options available for effective remedial actions? Are there plans to periodically reevaluate with a needs assessment?

4. Does the plan for standardized type, specialty, and numbers of human resources adequately support the normal trauma prehospital and hospital system activity? Who is responsible for administering/monitoring/enforcing the standards from an oversight agency, prehospital, and hospital perspective? Does each trauma center have personnel committed to the administration of the program?

5. Is there a plan for flexible response of the system during peak periods of activity? Is this response monitored by the agency and by the trauma centers? Is there a standard that addresses the maximum amount of time the trauma center can be on divert status?

6. Is there adequate access to specialty trauma units for pediatric, burn, spinal cord, and rehabilitation candidates?

b) Education

Purpose

The trauma system should have adequate education for all levels of trauma care personnel, both hospital and prehospital. The trauma plan should address:

- standards for the credentials, educational preparation, certifications, and continuing education requirements (including injury prevention and control) for all personnel
- incorporation of injury control information in educational standards for all trauma care personnel
- quality management monitoring of courses and instructors
- processes for state credentialing, certification, recertification, and decertification of trauma care personnel
- an organized needs assessment prior to developing new or additional educational activities.

Pre-Review Questionnaire

Please provide an explanation for each affirmative response. For each negative response, provide an explanation for the system's plan to comply.

1. Have you developed educational standards for all trauma caregiver personnel?

2. Have you done a trauma system educational needs assessment and identified educational levels of all prehospital providers, as well as the need for additional programs/certifications? Have you assessed all currently available educational programs prior to instituting new programs?

3. Does your trauma plan include central or state certification/recertification/decertification for prehospital providers?
   If no, what is your plan for certification/recertification/decertification of prehospital care providers as they relate to the trauma care system?

4. Describe the quality monitoring activity for review of educational requirements for trauma care personnel.

Documentation (Provide on site)

- A copy of the educational standards that have been developed for all trauma care personnel
- Description of certification process
- The specific portion of the system quality management program that monitors educational requirements for trauma care personnel

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Reviewer

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1. Has the system established educational standards for the level of education and certification for all trauma care providers? Has the system completed a needs assessment for education for prehospital care providers? Has there been resultant activity or development of a remedial plan?

2. Is there a central or state agency responsible for certification/recertification/decertification of prehospital care personnel?

3. Is there a quality management plan for trauma care personnel provider education?

4. Has the system established educational standards for hospital-based trauma care professionals? Are continuing education standards addressed? Has the system completed a needs assessment for additional educational or specialty service needs?

3) Prehospital Care

a) Emergency Medical Services Management Agency

Purpose

Each system should identify an agency that is ultimately responsible for prehospital care.

The administration of this agency should include:

- a medical director familiar with, experienced in, and currently involved in prehospital care
- a medical director whose qualifications are commensurate with his/her scope of responsibility in the EMS system
- quality improvement education and monitoring functions performed by the medical director or designee
- sufficient support staff, including a system administrator experienced in prehospital management

Educational programs should include:

- trauma education integrated with the prehospital training program
- continuing education tied to the quality improvement system

Criteria evaluated by the agency should include:

- triage, patient delivery decisions, treatment, and transfer protocols integrated with the EMS and trauma system
- ongoing quality improvement of triage/treatment/transfer criteria
- policies, procedures, and/or regulations regarding on-line and off-line medical direction

Certification to provide patient care by the agency should be based on standardized written and practical examinations given at regular intervals.

A system-wide quality improvement program should be established by the lead agency.

Pre-Review Questionnaire

Please provide an explanation for each affirmative response. For each negative response, provide an explanation for the system's plan to comply.

1. Is there an EMS agency that has the authority to regulate prehospital care?

2. Administration
   a. Is the management agency's medical director familiar with, experienced in, and currently involved in prehospital care?

   b. Are the medical director's qualifications commensurate with his/her scope of responsibility in the EMS system?

   c. Is there a quality improvement educational program, and are monitoring functions performed by the medical director or designee?

   d. Is there support staff, including a system administrator, familiar with and experienced in prehospital management?

3. Education
   a. Has the prehospital care management agency integrated care of the trauma patient into the prehospital training program?

   b. Has the prehospital care management agency developed ongoing trauma educational programs?

4. Criteria
   a. Are there protocols for triage, patient delivery decisions, treatment, and interhospital transfer?

   b. Have you implemented ongoing quality improvement of triage/treatment/interhospital transfer criteria?

   c. Have policies, procedures, and/or regulations regarding on-line and off-line medical direction been implemented within the system?

   d. Are standards from the Commission on Accreditation of Ambulance Services and the Commission on Accreditation of Air Medical Services integrated into patient delivery decisions, treatment, and transfer protocols?

5. Is there a standardized clinical examination for certification and decertification to provide patient care?

6. Is there a system-wide quality improvement program in place?

Documentation (Provide on site)

- Any legislation that gives authority to regulate prehospital care

- C Curriculum vitae of the medical director
- C Curriculum vitae of the support staff and their years/type of experience in prehospital management
- C Curriculum vitae and years/type of experience of the management agency's education staff
- C Any brochures, dates, and number of attendees for ongoing education programs conducted by the management agency in the past two years
- C Protocols for EMS triage, patient delivery decisions, treatment, and transfer
- C Policies, procedures, and/or regulations regarding on-line and off-line medical direction
- C Minutes of the past six meetings documenting ongoing quality improvement of triage/treatment/transfer criteria
- C Criteria for certification by the prehospital care management agency
- C A list of data collected for quality improvement by the management agency from the system
- C A list of the last 20 audited medical charts or summaries of the last two medical audits of charts or similar supporting documentation

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Reviewer

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1. From the reviewer's perspective, does the prehospital care management agency's administration have the authority, administrative structure, educational resources and programs, protocols, certification processes, data collection, medical audit processes, and quality improvement programs sufficient to meet the requirements of the trauma patients it serves?

2. Do prehospital care providers believe that the prehospital care management agency has the authority, administrative structure, educational resources and programs, protocols, certification processes, data collection, medical audit processes, and quality improvement programs sufficient to serve their patients' needs?

b) Ambulance and Non-Transporting Medical Unit Guidelines

Purpose

Each system should establish guidelines for non-transporting medical units (for example, quick response units) and for ground and air transportation that consider regulations, medical control, geographic boundaries, and topography.

- Personnel should, at a minimum, be trained and certified/licensed at the EMT-basic level and should have off-line medical direction. On-line medical direction should be available.

- Safe, reliable ambulance transportation**,** whether by ground, air**,** or water, is a critical component of an effective system. The type of transport should be matched to the system's topography and demography. Distribution of ambulances should facilitate appropriate and timely emergency response for the trauma patient.

- Standards, policies, or procedures governing hospital destination must be in place.

- Protocols concerning the mode of transport of the trauma patient (air or ground) should exist. The method of coordination between air and ground and procedures for rendezvous should be specified by protocol. These protocols should be carefully coordinated between the emergency medical services system and the trauma system.

- Protocols should exist concerning the interface between transporting and non-transporting units.

- A process for ambulance certification/licensing and decertification must be in place to ensure that vehicles and services meet minimum standards, including the minimum equipment recommended by the American College of Surgeons and/or state lead agencies.

- Mutual aid agreements must be in place among emergency medical services providers to provide adequate ambulance coverage when resources within a system have been exhausted.

- There must be interagency agreements with public safety agencies (for example, police and fire) that address security and safety of the injury scene.

Medical Non-Transporting Unit Guidelines

- A process for medical non-transporting unit (for example, quick response units, rescue units providing a medical response, and so on) certification/licensing and decertification must be in place to ensure that vehicles and services meet minimum standards.

- Personnel should, as a minimum, be trained and certified/licensed at the first-responder level and should have off-line medical direction.

- Protocols should exist concerning the interface between transporting and non-transporting units.

- There should be a placement strategy for non-transporting medical units to ensure they are located in areas where ambulance response may be delayed.

- There should be written agreements between non-transporting and transporting units clarifying, among other things, when non-transporting unit personnel ride with transporting units.

Pre-Review Questionnaire

Please provide an explanation for each affirmative response. For each negative response, provide an explanation for the system's plan to comply.

1. Are there system-wide guidelines delineating how the type of transportation for the trauma patient is matched to the system's topography and demography, including distance?

2. Are there statutorily authorized licensing requirements for ground, air, water, and other types of emergency medical transportation?

3. What is the minimum level of staffing (number of persons and their level of certification/licensure) of ambulances and non-transporting medical units responding to the scene?

4. What is the minimum level of staffing of ambulances providing interfacility transfers of a major trauma patient?

5. What are the requirements for on-line and off-line medical direction for ambulance services and non-transporting medical units?

6. Does the distribution of EMS vehicles allow for appropriate emergency response and transport times (based on patient needs and system resources)?

7. Do the licensing requirements for ambulances and non-transporting medical units specify minimum acceptable patient care equipment for all ages that generally conforms to the recommendations of the American College of Surgeons and/or state lead agency?

8. Are there standards, policies, and procedures governing hospital destination for ambulances?

9. Does the licensing of ambulance services and non-transporting units include regular inspections and/or an accreditation process based on continuous quality improvement?

10. Are mutual aid agreements among emergency medical service providers in place?

11. Are there protocols for the "interface" between ambulance services and non-transporting medical units?

12. Does the prehospital system have interagency agreements with public safety agencies (for example, police and fire) that address security and safety of the injury scene?

13. Are there written agreements between ambulance services and non-transporting medical units?

14. Is there a policy concerning air ambulance service/ground ambulance service dispatch, coordination, and rendezvous?

Documentation (Provide on site)

- Guidelines for the decision-making process of which type of transport (air vs. ground) to use
- The requirements for licensing of ambulance (air, ground, water, other) and non-transporting medical units, including personnel, equipment, minimum staffing requirements, medical direction, and others
- A listing of the levels of certification/licensure of prehospital EMS personnel and the number of each type in your system
- A brief description of the area served by the ambulance services and non-transporting medical units. If no designated service areas exist, include a map listing the location of each service by type (urban, rural, remote, wilderness) and include any applicable maps
- Demographic statistics of the population served by the ambulance services and non-transporting medical units
- The number of certified/licensed ambulances, both ground and air, for your system, including (if known) a graphical depiction of each service's designated area of coverage
- The required patient care equipment list for each level of ambulance certification
- Guidelines, policies, or procedures governing hospital destination of ambulance services
- Mean, median, and ranges of response times for on-scene, out-of-service, and total transport time for transports by ground and air
- Statistics for number of prehospital care providers and their level of certification per ambulance

- Certificate regulations for ground and air ambulance for each level of certification
- The number and percentage of ground ambulances certified by the Commission on Accreditation of Ambulance Services
- The number and percentage of air ambulances accredited by the Commission on Accreditation of Air Medical Services
- Sample copies of mutual aid agreements

Reviewer

1. Are the ambulance service and the non-transporting medical unit licensing requirements consistent with the needs of the trauma patient and with the guidelines of the American College of Surgeons and/or the state lead agency?
2. Are the system's personnel and equipment matched appropriately to the topography and clinical needs of the population?
3. Are mutual aid agreements effective in providing adequate ambulance coverage when resources within a system are exhausted?
4. Are the hospital destination requirements consistent with the needs of the trauma patient and with the overall design of the comprehensive trauma care system?
5. Do the air and ground coordination and rendezvous requirements make sense for the major trauma patient and are they integrated into the overall design of the trauma care system? Do they make "medical sense" and do they make "economic sense"?
6. Is the medical direction of the prehospital emergency medical services providers carefully coordinated with the medical direction of the trauma care system and with that of the overall emergency medical services system?
7. Do prehospital care providers know of all applicable protocols for the trauma patient, and are they following them?
8. Are the EMS system response times conducive to optimal care of the trauma patient?

c) Communications System

Purpose

Each system should develop a prehospital communications system that is fully integrated with the remainder of the EMS and emergency/disaster preparedness systems. Beginning with the universal systems access number, the communications network should provide for prioritized dispatch, postdispatch instructions, dispatch-to-ambulance communication, ambulance-to-ambulance communication, ambulance-to-hospital communication, and hospital-to-hospital communication to ensure adequate EMS system response and coordination.

- Medical direction and dispatch should be coordinated.
- An EMS dispatch protocol should be utilized.
- A 911 or enhanced 911 system should be in place and should receive all public calls that request EMS response to trauma patients.
- All dispatch centers, vehicles, aircraft, and base stations should be equipped with adequate communications systems. Equipment must ensure that there are minimal geographic areas where communications cannot be established and that at least 95% of communications attempts are successful.
- Priority dispatch and postdispatch instruction protocols should be in place.
- A quality improvement program should be in place.

Pre-Review Questionnaire

Please provide an explanation for each affirmative response. For each negative response, provide an explanation for the system's plan to comply.

1. Do you have a communications network that includes a universal systems access number, prioritized dispatch, postdispatch instructions, dispatch-to-ambulance communication, ambulance-to-ambulance communication, ambulance-to-hospital communication, and hospital-to-hospital communication?
2. Does the system have coordination of medical direction and dispatch?
3. Have you implemented an EMS dispatch curriculum to train communications personnel? If no, describe plans for an EMS dispatch curriculum.
4. Do you have a public access communications system (911 or enhanced 911)?

5. Does the 911 system receive all public calls that request EMS response to trauma patients?

6. How frequently are dispatch-to-ambulance, ambulance-to-hospital, and hospital-to-hospital communication attempts unsuccessful? Are there geographic areas where communications cannot be established?

7. Are all dispatch centers, ground and air ambulances, and base stations equipped with adequate communications systems?

8. Are EMS dispatch protocols in place?

9. Are priority dispatch and postdispatch protocols in place?

10. Describe the dispatch-to-ambulance, ambulance-to-ambulance, dispatch-to-hospital, ambulance-to-hospital, and hospital-to-hospital communications network.

11. Identify and describe how communications systems interrelate during mass casualty and disaster incidents.

12. Is there a communications quality improvement program?

Documentation (Provide on site)

- Descriptive statistics for the percentage of 911 and enhanced 911 coverage by population and area
- Percent of time communications are not accomplished
- A description of how medical direction and dispatch are coordinated
- A copy of EMS dispatch protocols
- A copy of priority dispatch and postdispatch instruction protocols
- The number and percentage of ground and air ambulances not equipped with communications systems
- Documents providing evidence of a communications quality improvement program

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Reviewer

1. Does the system have an integrated communications central control for medical direction and dispatch?

2. Are there priority dispatch and postdispatch instructions, and are they used?

3. Does the 911 access number receive most of the public calls for EMS? If payors have separate emergency access numbers, are calls for emergency response to trauma patients managed appropriately?

4. How frequently do prehospital care providers report that dispatch-to-ambulance and ambulance-to-hospital communications cannot be established?

d) Emergency/Disaster Preparedness Plan

Purpose

Each system should develop a prehospital emergency/disaster preparedness plan that is fully integrated with the remainder of the EMS system, local government, private sector, and acute care facilities.

C The system should have periodic educational exercises with postexercise review.

Pre-Review Questionnaire

Please provide an explanation for each affirmative response. For each negative response, provide an explanation for the system's plan to comply.

1. Is the prehospital emergency/disaster preparedness plan integrated with the remainder of the EMS system, local government, private sector, and acute care facilities?

2. Are there periodic educational exercises with postexercise review?

Documentation (Provide on site)

C A copy of the disaster plans for prehospital, hospital, local government, and private sector

C Documentation of dates, scenarios, and postexercise review minutes from periodic educational exercises

Reviewer

1. When was the last update of the prehospital emergency/disaster plan?

2. Do representatives of the prehospital management agency, local EMS system, local government, and private sector believe that their emergency/disaster preparedness plans are well integrated?

3. What are the responses of the prehospital management agency, local EMS system, local government, and private sector representatives to the most recent periodic educational exercise?

4. How many disaster plans are functional in the region? Have attempts been made to consolidate these into one plan?

4) Definitive Care Facilities

a) Trauma Care Facilities

Purpose

Injured patients should be delivered in a timely manner to the nearest *appropriate* facility. Regionalization of trauma care involves participation of hospitals that have the resources necessary to provide care for injured patients. A needs assessment study will provide an inventory of available resources, both human and physical, in the area to be regionalized. Trauma systems should be "inclusive" in nature, which means that the trauma care system will:

- address the needs of *all* injured patients requiring hospitalization for injury
- utilize all qualified medical resources

The trauma system plan should integrate all facilities into an *inclusive* system or network of definitive care facilities to provide a spectrum of care for all injured patients.

Trauma Centers

- The trauma system lead agency should provide uniform standards for trauma centers (The criteria established by the American College of Surgeons Committee on Trauma and the Resources document are examples.)
- The trauma system lead agency should determine the optimal level and number of trauma centers, based on anticipated volume, available resources, and geography. This determination should be based on the needs assessment study. Reevaluation should be based on the quality management process plus volume and need.

Other Trauma Care Facilities

- The role and responsibility of other acute care facilities within the system should be defined and integrated in the evaluation process.
- The role and responsibility of specialty centers (pediatric, burn, spinal cord injury) should be defined and integrated in the evaluation process.

Designation Process

- Describe the process for selecting and designating trauma centers.
- Describe the process for monitoring all treatment.
- Describe process for redesignation and dedesignation.
- Describe the process for adding other centers or deleting existing centers.

Pre-Review Questionnaire

Please provide an explanation for each affirmative response. For each negative response, provide an explanation for the system's plan to comply.

1. Are there identified designation standards for trauma centers?

2. Is there a process for designation of trauma centers?

3. Do you have an estimate of the number of trauma patients?

4. Do you have an estimate of the number of trauma surgeons (general surgeons, neurosurgeons, and orthopaedic surgeons)?

5. Do you have documentation of the available resources in the acute care facilities?

6. Are all acute care facilities willing to provide at least a minimum data set on trauma patients?

7. Is the designation process of trauma centers based on the determination of need?

8. Is there a process and authority for redesignation and/or de-designation?

9. Do you have a definition of major trauma patient?

10. Do you have a continuous quality improvement process in place for the trauma system?

Documentation (Provide on site)

- A copy of the criteria for designated trauma centers (include a breakdown for the various levels of trauma centers as defined in the ACS COT Resources for Optimal Care of the Injured Patient document.

- A copy of the process for designation, dedesignation, and redesignation of trauma centers

- Epidemiologic data regarding:
  - population being served
  - number of major trauma patients
  - geography of area
  - transportation capabilities (ground and air)
  - communications capabilities
- A copy of the authority to:
  - designate, redesignate, and de-designate trauma centers
  - define service areas
  - control prehospital transport agencies

- A list of acute care facilities with the bed capacity and ICU bed capacity
- Documentation of anesthesia, emergency medicine, general surgery, orthopaedic surgery, and neurosurgical capabilities of all acute care facilities in the trauma system region
- Letters of commitment for anesthesia and surgical specialties (general, neurological, and orthopaedic) from the appropriate local or regional societies

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Reviewer

1. Does the lead agency have the authority to designate a limited number of definitive care facilities?

   Does this authority include redesignation and de-designation?

2. Does the lead agency have the authority to define the service areas for the individual acute care facilities?

3. Does the lead agency have the authority to control the prehospital transport agencies?

4. Does the system have a process for communication among all acute care facilities caring for trauma patients?

5. Do the acute care facilities have a regional plan for dealing with the various payors (for example, managed care)?

b) Interfacility Transfer

Purpose

Central to the concept of an inclusive trauma system is the provision for appropriate and expeditious transfer, when necessary, of injured patients between acute care facilities. The decision to transfer a trauma patient should be based on objectively agreed upon criteria that pertain to transfers to both higher and, where appropriate, lower levels of care. Established transfer criteria will minimize discussions about individual patient transfers and ensure optimal patient care. It is essential that the transfer agreements include provisions required under the Consolidated Omnibus Reconciliation Act (COBRA) and subsequent revisions of the Act.

Interfacility transfer is particularly important in the following situations:

- linkage between the urban and rural components of a trauma system
- patients requiring specialty facilities, such as pediatrics, burns, and spinal cord injury, or the need for further rehabilitation
- movement of patients between acute care facilities and trauma centers
- appropriate transfer of patients between trauma facilities
- movement of patients from trauma facilities back to local communities when appropriate

The process of transferring injured patients from acute to rehabilitation care facilities will be facilitated by establishing written transfer agreements between acute and rehabilitation care facilities in the system. The decision to transfer spinal cord injury (SCI) and traumatic brain injury (TBI) (severe/ moderate TBI) patients to rehabilitation facilities that provide specialized programs in SCI and TBI should be based on objectively agreed upon criteria.

Inherent in the transfer of any trauma patient is feedback from the receiving to the transferring facility.

- The trauma system should ensure that interfacility transfers occur in a timely fashion commensurate with patients' clinical needs.
- The trauma system should establish standards for the mode of transportation and qualifications of transport personnel.
- The trauma system should have a model transfer agreement.
- The trauma system should ensure that all interfacility transfers are based on patient needs and are in the best interest of the patient.
- Trauma centers should have transfer agreements with rehabilitation centers that provide specialized programs in SCI and TBI.

- Trauma centers should have transfer agreements with rehabilitation centers that provide inpatient and intensive outpatient rehabilitation for patients with diagnoses other than SCI or severe/moderate TBI, such as mild TBI, amputations, burns, or other major injuries deemed appropriate for rehabilitation.

- The trauma system should be cognizant of the cost issues and ensure the most cost-effective strategies that are consistent with optimal care.

- A process (CQI) to measure patient outcome as it relates to transfer should be in place.

Pre-Review Questionnaire

Please provide an explanation for each affirmative response. For each negative response, provide an explanation for the system's plan to comply.

1. Do you have written transfer agreements between trauma centers and other acute care facilities in the system?

2 Do you have written transfer agreements for injured patients with special problems such as:
   - burns
   - pediatrics
   - spinal cord injury
   - brain injury
   - rehabilitation
   - other injuries that cannot optimally be treated at your facility

3. Do you have written transfer agreements between designated trauma centers and rehabilitation centers for patients with the traumatic diagnoses of SCI, TBI (severe/moderate/mild), multiple trauma injuries, amputations, and burns?

4. Do you have a plan that defines objective criteria for the transfer of injured patients from designated trauma care facilities to contracted hospitals and physicians?

5. Do your transfer agreements deal with the mode of transportation and the type and qualifications of transport personnel?

6. Do your transfer agreements comply with COBRA regulations?

Documentation (Provide on site)

1. Signed copies of all written transfer agreements:
   - facility-to-facility
   - facilities with transport agencies
   - facilities with managed care entities
2. The "managed care plan" for the trauma system

Reviewer

1. Do appropriate transfer agreements exist?
2. Does the system have a viable plan to deal with the managed care entities within the system? Specifically, can the system ensure that injured patients will be transferred to the most appropriate facility commensurate with their injuries? This includes transfer to trauma centers and transfer from trauma centers to other facilities.

c) Medical Rehabilitation

Purpose

As an integral component of the trauma system, rehabilitation centers provide coordinated post acute care for trauma patients who have sustained catastrophic injuries, resulting in permanent or long-standing impairments.

The trauma system should demonstrate *strong linkages and transfer agreements* between designated trauma centers and rehabilitation centers located in its geographic region (in or out of state).

- The trauma system should convene a *joint liaison committee* to be comprised of appropriate health professionals from designated trauma centers and rehabilitation centers (for example, trauma surgeon, physician with expertise in rehabilitation, physical therapist, occupational therapist, nurse case manager, hospital administrator, and so on).

- Input from payors should be sought.

- The trauma system should ensure that the rehabilitation process begins in the acute care facility as soon as possible.

- To maintain clinical expertise and skills, each rehabilitation center that provides specialized programs in SCI and TBI should have a critical mass of patient volume in SCI and TBI.

- Each rehabilitation center that provides a specialized program in TBI should have an appropriately qualified Medical Director for TBI. It is recommended that the *Medical Director of the TBI Program* meet all of the following requirements: (a) have two years of experience in brain injury rehabilitation and/or completed a fellowship in brain injury, and (b) have board certification in a specialty field of medicine.

- Each rehabilitation center that provides inpatient and intensive outpatient rehabilitation for trauma patients should have an appropriately qualified Medical Director for Rehabilitation. It is recommended that the *Medical Director of Rehabilitation* meet the following requirements: (a) have two years of experience in rehabilitation and/or completed a fellowship in a rehabilitation specialty, and (b) have board certification in a specialty field of medicine.

- The trauma system should encourage clinical pathways for the major traumatic diagnoses that affect patients' rehabilitation outcomes.

- The trauma system should identify and collect, at appropriate times, the necessary data elements for analyzing patient outcomes and evaluating the effectiveness of the trauma system. Data to be collected may include:
  - new injury admissions per year of SCI, TBI, and dual-diagnosis patients to each rehabilitation center

  - indicators of patient severity, including complications (for example, ASIA classification

system for SCI, Glasgow coma scale for TBI)
- time between acute care and initiation of rehabilitation
- acute care length of stay
- length of stay at rehabilitation center
- functional independence measure (FIM) score
- facility or location to which patient was discharged
- type of outpatient rehabilitation care received (for example, hospital-based, home, nursing home)

C The trauma system should have *data exchange procedures* that will provide feedback (for example, patient outcomes, effectiveness of delivery system, and so on) to the trauma, acute care, and rehabilitation care providers.

C The trauma system should conduct *long-term outcome research* in rehabilitation of trauma patients and provide for appropriate dissemination of research results.

Pre-Review Questionnaire

Please provide an explanation for each affirmative response. For each negative response, provide an explanation for the system's plan to comply.

1. Is there a joint liaison committee composed of clinical and administrative representatives from the designated trauma centers and rehabilitation centers?

2. Are there existing trauma system policies and procedures that appropriately address each of the following issues:

   a) transfer agreements and documentation
   b) treatment guidelines for acute and rehabilitation care
   c) evaluation of patient outcomes and system of care
   d) data exchange procedures
   e) alternative plans for unfunded patients
   f) long-term outcome research

3. Is there a standardized set of rehabilitation data (for example, patient outcome data) that rehabilitation facilities must collect and report to the trauma system database?

4. Do the rehabilitation centers have a set of minimum requirements/qualifications that the physician leaders must meet (for example, Medical Director of SCI Program, Medical Director of TBI Program, Medical Director of Rehabilitation)?

5. Is there an exchange of outcome data among the trauma, acute care, and rehabilitation facilities?

6. Within the trauma system, what mechanisms are in place to ensure that rehabilitation care is strongly integrated into all phases of acute, primary, and community care?

Documentation (Provide on site)

1. A list of the members of the joint liaison committee and the responsibilities and objectives of the committee

2. Data pertaining to the number of new injury SCI and TBI admissions per year

3. Data pertaining to the number of inpatient beds designated for rehabilitation

4. Qualifications/credentials of the following physicians in the rehabilitation centers that treat trauma patients: Medical Director of the SCI Program, Medical Director of the TBI Program, and Medical Director of Rehabilitation

5. Policies and procedures that address each of the following issues:
   a) transfer agreements
   b) treatment guidelines for major traumatic diagnoses
   c) evaluation of patient outcomes
   d) data exchange procedures
   e) alternative plans for unfunded patients
   f) long-term outcome research

6. A list/table of the rehabilitation data elements that are reported to the trauma system database (including patient volume of new injury SCI admissions per year and the patient volume of new injury TBI admissions per year)

Reviewer

1. Does the system ensure appropriate rehabilitation care?

2. Does the trauma system have strong trauma rehabilitation leadership? (for example, are physicians with expertise in rehabilitation who deal with trauma patients incorporated into the planning and development process, and do they have authority and responsibility to carry out these functions?)

3. Is rehabilitation care integrated into the trauma system?

5) Information Systems

Purpose

The ideal trauma care system has an information system that provides for the timely collection of data from all providers in the form of consistent data sets with minimum standards. The information system should be designed to provide system-wide data that allow and facilitate evaluation of the structure, process, and outcomes of the entire system, all phases of care, and their interactions. An important use of this information is to develop, implement, and influence public policy. Policies and procedures to facilitate and encourage injury surveillance and trauma care research should be developed, including:

- System-wide plan for collection and collation of trauma care data and cost data should be encouraged
- Definition of minimum data sets
- Well-defined roles and responsibilities for agencies and institutions regarding data collection
- Process to evaluate the quality, timeliness, and completeness of data
- Process to ensure appropriate patient and provider confidentiality
- Data acquisition of all appropriate sources. These can include:

    1. Law enforcement, crash, and incident reports
    2. Prehospital care reports
    3. Emergency department data
    4. Trauma registry
    5. Hospital discharge data, including rehabilitation and specialty care facility
    6. Medical examiner/coroner records
    7. Death certificates
    8. Payor records

- Attempts to benchmark outcomes against larger data sets (such as NTDB™)

Pre-Review Questionnaire

Please provide an explanation for each affirmative response. For each negative response, provide an explanation for the system's plan to comply.

1. Does your system have ready access to:

    a. Law enforcement crash and incident reports
    b. Prehospital care reports

c. Emergency department data
d. Acute care facility data including:
   (1) trauma centers
   (2) other acute care hospitals
   (3) specialty centers, including burns and rehabilitation
e. Medical examiner/coroner reports
f. Death certificates
g. Payor records
h. Trauma registry

2. Describe the population of patients that each database includes.

3. Which of the above databases are kept in computerized format?

4. Which databases have a system-wide or (partial) standardized format or subset?

5. Which of the above databases can be linked?

6. Do you gather E code data?

7. Describe the role and responsibilities of agencies and institutions for collecting and maintaining the data.

8. How is the completeness, timeliness, and quality of the data monitored?

9. What are the standards for data collection and reporting from each data provider?

10. How is the confidentiality of the data ensured and monitored?

Documentation (Provide on site)

1. Examples of the minimum data sets and data collection tool that are used system-wide for each phase of care (1 through 7 above)

2. Documentation of the system's requirements that define the roles and responsibilities of agencies and institutions for data collection and collation

3. A copy of the rules that ensure confidentiality for providers and patients

4. Examples of using information to influence public policy

5. The purposes for and processes by which data can be released

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Reviewer

1. Can the system answer the following questions?

    a. How many patients were injured?
    b. How many were seen in emergency departments?
    c. How many were admitted to the hospital?
    d. How many were admitted to trauma centers?
    e. How many were transferred between non-trauma center hospitals?
    f. How many were transferred to rehabilitation from trauma centers and from non-trauma centers?
    g. What opportunities exist for better linkage of databases?

2. How do you use the linked data to improve patient outcome or for injury prevention and control?

6) Evaluation

Purpose

The trauma care system should monitor its own performance and the performance of its components. This evaluation should include continual reassessment of system operations and goals as they relate to patient needs, availability of appropriate resources, and costs. It is essential to measure compliance to standards, document system effectiveness, and identify quality improvement opportunities. System evaluation should include:

- System-wide quality management plan
- Lead agency responsible for system quality management plan
- Monitoring of system performance and performance of individual components
- A periodic review and update of system standards as they relate to patient needs, system resources, and costs
- Periodic review and update of trauma facility standards
- A quality improvement process that assesses the effectiveness of the trauma system
- A quality improvement process that measures the compliance to standards by each agency and institution
- A process to ensure patient and provider confidentiality
- A process to require and ensure appropriate facility quality management programs and appropriate interaction between facility quality management programs
- A process to determine the changes and incentives (risks and benefits) in caring for trauma patients

Pre-Review Questionnaire

Please provide an explanation for each affirmative response. For each negative response, provide an explanation for the system's plan to comply.

1. Describe the concurrent plan for evaluating the individual trauma system components and system operations. This plan should include quality improvement for EMS trauma centers, and so on. How does the system monitor compliance with system standards for each component─prehospital acute care facilities, acute care facilities, trauma center specialty centers, rehabilitation centers?

2. Is there a quality improvement committee for the system? To whom does it report? Who reports to the committee?

3. Is there a unified approach to quality improvement throughout the system?

4. How do the quality improvement programs for each component support the other elements of the system? (For example, does the quality improvement program for prehospital feed into the trauma center and back? Does quality improvement of trauma centers feed into acute care hospitals?)

5. What group/body oversees the quality assurance for the whole system?

6. Are there standardized filters that each component of the system must audit and report to the system?

7. How does the system quality management program interface with trauma center quality management programs?

8. Does the trauma center designation process require trauma centers to demonstrate that they have established authority, responsibility, and organized structure for the quality management program?

9. Is there a system-wide process for monitoring quality of care, including establishment of standard of care, concurrent review, systematic evaluation of audit filters for care review, multidisciplinary case review, and trending of patient-related data (including process and outcome indicators)?

10. If there is no system-wide process, provide examples from the trauma center quality assurance program.

11. What data are acute care facilities required to submit for the system quality improvement program?

12. If there is a system trauma registry, how does it contribute to the quality improvement?

13. How have changes and incentives affected the care of the trauma patient, and what are the branching impacts of these changes?

Documentation (Provide on site)

1. A summary of the system-wide quality management plan (have an entire plan available at the time of review)
2. A flow chart diagramming the components of the system quality management plan, including the lead agency and the reporting structures from each type of providing group to and through the system

3. Examples of system standards and the process by which they are updated and revised

4. A description of the chain of events by which a problem with the system can be identified and

corrected (if possible, give examples of such occurrences)

Reviewer

1. What public policy changes have occurred as a result of your system evaluation process?

2. What changes in patient care have occurred as a result of your system evaluation process in the area of prehospital care, acute care, and rehabilitation phases?

3. What additional studies have been instituted as a result of your system evaluation process?

7) Research

Purpose

The system should facilitate and encourage trauma-related research. The system should facilitate epidemiologic research in prehospital care, acute care, rehabilitation, and prevention.

- There should be a process to facilitate access to data for trauma-related research, including, but not limited to:

  a. Cost-effective research
  b. Outcomes research
  c. Epidemiology
  d. Injury control research
  e. Quality-of-life research

- There should be a process to acquire funding for research.

- There should be a definition of the research requirements from each system component and for each type of facility.

Pre-Review Questionnaire

Please provide an explanation for each affirmative response. For each negative response, provide an explanation for the system's plan to comply.

1. Describe the process for gaining access to system data for research purposes.

2. What funding does the system make available for research?

3. Please submit examples of trauma-related research in each of the above categories conducted or facilitated by the system.

Documentation (Provide on site)

1. A bibliography of research conducted or facilitated by the trauma system and by individual institutions using system-wide data

2. A summary of research funding provided by the system

Reviewer

1. Describe the options available for research or to gain access to various components of the research data.

2. Is there an injury surveillance program within the system, and where is it located?

3. Is there a state trauma registry? Who has access to the data for trauma-related research?

4. Is there a central location in the state where each of the components listed under **Purpose** is collected, and what is the process for gaining access to those data?